

WHAT IS CLAIMED IS

- 1 1. A method for verifying an electron treatment field created by an
2 electron treatment beam, comprising:
3 positioning an imaging device; and
4 operating said imaging device to detect an image created by
5 photons generated in the delivery of said electron treatment beam.
- 1 2. The method of claim 1, further comprising:
2 enhancing said image to generate a representation of said electron
3 treatment field.
- 1 3. The method of claim 1, wherein said imaging device is a flat panel
2 imaging device.
- 1 4. The method of claim 1, wherein said imaging device is positioned
2 downstream from a location to be irradiated by said electron treatment
3 beam.
- 1 5. The method of claim 3, wherein said flat panel imaging device
2 comprises a plurality of solid state sensors.
- 1 6. The method of claim 5, wherein said solid state sensors are
2 amorphous silicon sensors.
- 1 7. The method of claim 1, wherein said imaging device comprises
2 video technology.
- 1 8. The method of claim 1, wherein said enhancing further comprises:

2 determining an energy of said electron treatment beam;
 3 calculating an angular dependence of said photons on said electron
 4 treatment beam; and
 5 generating said representation of said electron treatment field based
 6 on said detected image and said angular dependence.

1 9. The method of claim 1, wherein said enhancing further comprises:
 2 comparing said image to an open field image to generate an
 3 enhanced image of said electron treatment field.

1 10. The method of claim 1, further comprising:
 2 displaying said representation of said electron treatment field on an
 3 operator display console.

1 11. The method of claim 1, further comprising:
 2 comparing said representation of said electron treatment field to a
 3 desired image of said electron treatment field.

1 12. The method of claim 8, further comprising:
 2 adjusting at least one of a collimator position and a patient position if
 3 said comparison indicates that said representation of said electron
 4 treatment field is different from said desired image of said electron
 5 treatment field.

1 13. A method for verifying a treatment field in a radiation therapy device,
 2 comprising:
 3 positioning an imaging device at a body to be irradiated;
 4 directing an electron beam at said body;
 5 collimating said electron beam to generate an electron treatment
 6 field; and

7 detecting, using said imaging device, an image created by a plurality
8 of photons after passing through said body, said plurality of photons
9 contained within said electron treatment field.

1 14. The method of claim 13, further comprising:
2 enhancing said image to generate a representation of said electron
3 treatment field.

1 15. The method of claim 13, wherein said plurality of photons are
2 bremsstrahlung photons.

1 16. The method of claim 14, further comprising:
2 comparing said representation with a desired image of said electron
3 treatment field; and
4 repositioning at least one of said body and a collimator device if said
5 comparing indicates that said representation is not within an expected
6 tolerance of said desired image.

1 17. The method of claim 14, wherein said enhancing further comprises:
2 determining an energy of said electron treatment beam;
3 calculating an angular dependence of said photons on said electron
4 treatment beam; and
5 generating said representation of said electron treatment field based
6 on said detected image and said angular dependence.

1 18. The method of claim 13, further comprising:
2 positioning an imaging device beneath a treatment zone;
3 directing an electron beam at said treatment zone;
4 collimating said electron beam to generate an electron treatment
5 field;
6 detecting, using said imaging device, an open field image; and

7 comparing said open field image with said image to produce a
8 representation of said electron treatment field.

1 19. A radiation treatment field verification method, comprising:
2 generating a radiation treatment beam comprised of one of primary
3 electrons and primary photons;
4 selectively shaping said radiation treatment beam to create a
5 radiation treatment field on a body;
6 detecting components of said radiation treatment beam on an
7 imaging device positioned downstream of said body; and
8 generating a representation of said radiation treatment field.

1 20. The method of claim 19, wherein said radiation treatment beam
2 comprises primary electrons and wherein said components of said
3 radiation treatment beam are bremsstrahlung photons generated within
4 said radiation treatment beam.

1 21. The method of claim 19, wherein said radiation treatment beam
2 comprises primary photons and wherein said components of said radiation
3 treatment beam are photons of said radiation treatment beam.

1 22. The method of claim 19, wherein said selectively shaping is
2 performed by controllably positioning a photon collimator and an electron
3 collimator.

1 23. The method of claim 20, wherein said generating a representation
2 further comprises:
3 determining an energy of said primary electrons;
4 calculating an angular dependence of said bremsstrahlung photons
5 on said primary electrons; and

6 generating said representation of said radiation treatment field
7 based on said detected components and said angular dependence.

1 24. The method of claim 20, wherein said generating a representation
2 further comprises:

3 generating an open field representation of said radiation treatment
4 field; and

5 comparing said open field representation with said components
6 detected downstream of said body to generate said representation of said
7 radiation treatment field.

1 25. A radiation therapy device, comprising:

2 an image detector positioned downstream from a body being
3 irradiated by an electron beam and capturing a radiation image, said
4 electron beam having a field shape at said body; and

5 a computing device coupled to said image detector and operative to
6 enhance said radiation image to generate a representation of said radiation
7 image.

1 26. The radiation therapy device of claim 25, further comprising:

2 a display device coupled to said computing device and displaying
3 said representation of said radiation image.

1 27. The radiation therapy device of claim 25, further comprising:

2 at least a first collimating device positioned along a path of said
3 electron beam and controllably positioned to generate said field shape.

1 28. A system for verifying an electron treatment field, comprising:

2 means for positioning an imaging device; and

3 means for operating said imaging device to detect an image created
4 by photons generated in the delivery of said electron treatment field.